

SY183072

15 April 2019

Catholic Education Diocese of Parramatta  
C/- TSA Management  
Cassandra Naccarella  
Level 15, 207 Kent Street  
Sydney NSW 2000

Dear Cassandra,

**Re: Santa Sophia Catholic College – SEARS Condition 16 - Flooding**

This flooding assessment has been prepared by Northrop Consulting Engineers on behalf of the Catholic Education Diocese of Parramatta C/- TSA Management Pty Ltd (the Applicant).

It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD 18\_9772) for the new Santa Sophia Catholic College on the corner of Fontana Drive and the future road 'B', between Red Gables Road and Fontana Drive, in Box Hill North (the site).

The new school will cater for approximately 1,920 primary and secondary school students, inclusive of a 60 student Catholic Early Learning Centre. The school will have 130 full-time equivalent staff.

The proposal seeks consent for approximately 15,000sqm of floor space across a part five and part six storey building. The building will present as three main hubs connected by terraced courtyards and garden spaces.

The school will include:

- Catholic Early learning centre for 60 students
- General Learning Spaces for years Kindergarten to 12
- Community Hub – knowledge centre and cafe
- Creative Hub – art and applied science
- Performance Hub – multipurpose hall and music, dance and drama spaces
- Professional Hub – administrative space
- Research Hub – science and fitness
- Associated site landscaping and open space including a fence and sporting facilities
- Bus drop off from Fontana Drive
- Pick-up and drop-off zone from future road 'B'
- Pedestrian access points from Red Gables Road north, Fontana Drive and future road 'B'
- Staff parking for 110 vehicles provided off site in an adjacent location
- Short term parking for pick up and drop off for Catholic Early Learning Centre from Red Gables Road
- Digital and non-digital signage to the school

The purpose of this flooding assessment is to respond to SEARS Condition 16. Included herein is an extract from the SEARs outlining the condition, description of the subject site, a summary of the results from the latest approved flood model of The Gables Precinct, commentary around the proposed flood risk and measures used to manage that risk.

		Date
Prepared by	GB	15/04/2019
Checked by	LG	15/04/2019
Admin	BM	15/04/2019

## Extract from SEARs

### 16. Flooding

*Identify flood risk on-site (detailing the most recent flood studies for the project area) and consideration of any relevant provisions of the NSW Floodplain Development Manual (2005), including the potential effects of climate change, sea level rise and an increase in rainfall intensity. If there is a material flood risk, include design solutions for mitigation.*

### Subject Site

The subject site is located within The Gables Town Centre, at the corner of Fontana Drive and Road B. The main lake and detention basin for The Gables is located to the north, and riparian corridors are located to the north and east of the subject site – crossing under Fontana Drive and Red Gables Roads respectively.

Topography is to be altered from existing conditions across to the town centre to form a localised crest with levels ranging from approximately 35 to 39m AHD. Levels generally fall to the north and east towards the lake and riparian corridor.

Multi-storey buildings are proposed across the subject site, generally along the southern, western and northern frontages. Finished ground flood levels are noted on preliminary plans prepared by Taylor Thomson Whitting as being between 35.3 and 39.3 m AHD.

The general site location and bulk earthworks topography are shown overleaf in **Figure 1** and **Figure 2**.

### Flood Studies and Results

A TUFLOW model for The Gables Precinct has been prepared by Northrop in support of DA 1824/2017/ZB for the Lake and Town Centre. This development application has been approved by The Hills Shire Council late 2018.

This model used a rainfall on grid hydrology and considered events ranging from the 39.35%AEP (1 in 2 year) through to the PMF (Probable Maximum Flood). Extracts are included overleaf.

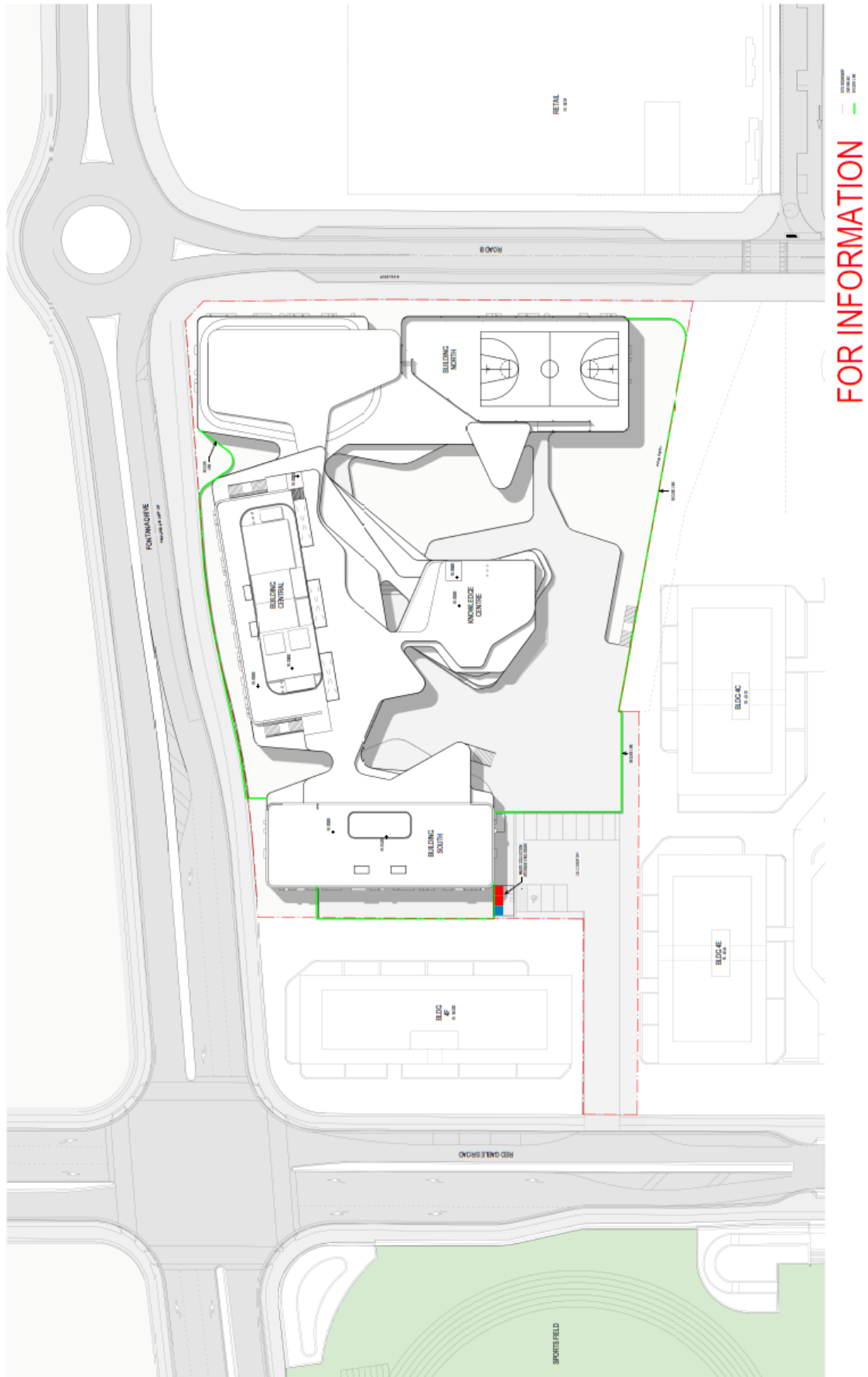
A summary of the flood results is presented below in **Table 1**. Extracts from the DA engineering report are presented in **Figure 3**, **Figure 4**, **Figure 5** and **Figure 6**.

**Table 1 - Flood Levels (m AHD)**

Event	Lake	Riparian Corridor	D/S Red Gables Road
5% AEP	27.79	29.63	29.69
1% AEP	28.38	29.88	29.96
1 in 10,000 AEP	29.85	30.33	30.43
PMF	31.36	31.44	31.48

It is noted these levels are significantly lower than the level of the subject site.

For the subject site, the potential impacts of climate change are limited to an increase in rainfall intensity. Sea level rise is not appropriate due to the elevations encountered on-site. The PMF has a rainfall intensity orders of magnitude greater than the 1% AEP and this still does not inundate the site. It is considered that climate change will not adversely impact the site from a regional flooding perspective.



**Figure 1 - General Site Location (BVN Architecture 2019)**

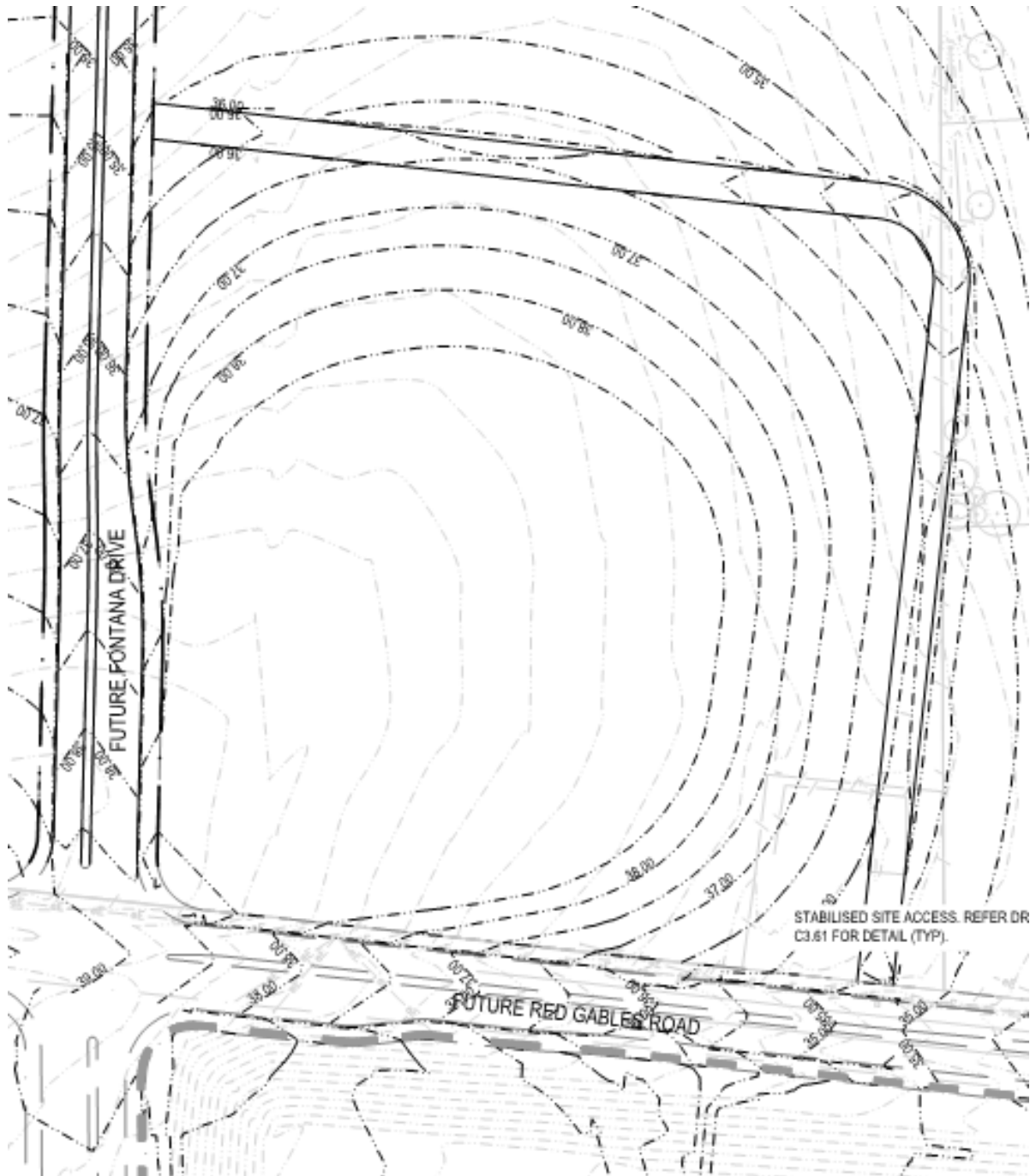


Figure 2 – Bulk Earthworks Surface (Enspire Solutions 2019)



This aerial map displays the 'Subject Site' and its surrounding precincts. The site is a large, irregularly shaped area with a blue-shaded central region. It is bordered by Precinct E to the north, Precinct F to the south, and Precinct G to the east. The map includes several elevation points marked with red dots and numerical values: 25, 26, 26.06, 28.38, 28.48, 29, 29.88, 29.96, 30, 30.24, 31, 32, 32.41, and 33. A grey circle is located within the Subject Site, near the bottom center. The map also shows a network of roads and a green line running diagonally across the area.

Page 5 of 7





Figure 5 - 1 in 10,000 AEP

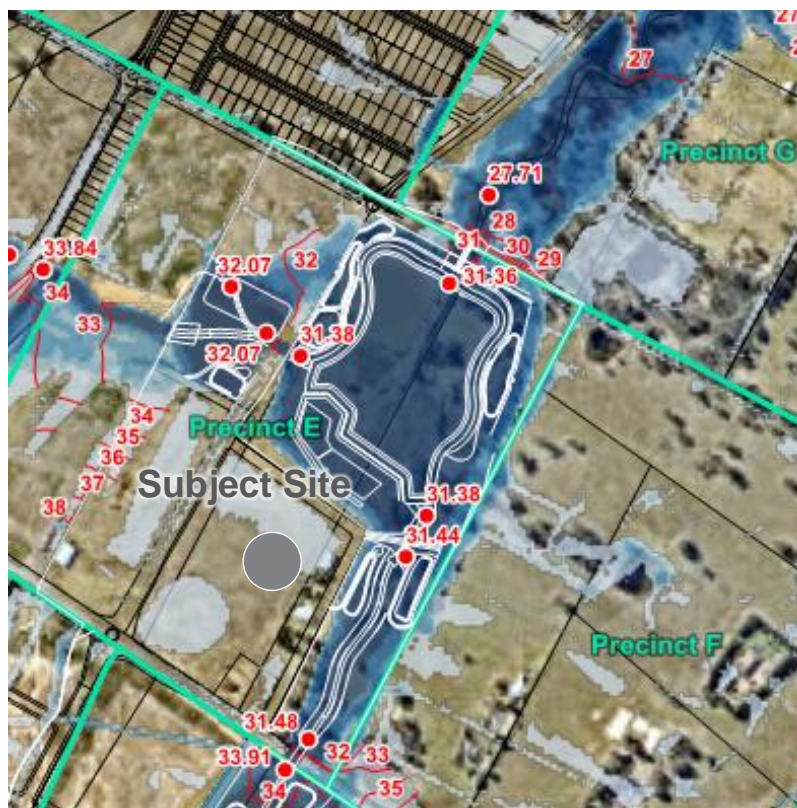


Figure 6 - PMF Water and Elevation

## **Flood Risk**

The Floodplain Development Manual requires all events up to the PMF be considered when determining flood risk. It makes recommendations as to setting what is an acceptable risk to buildings as well as recommendations for managing risk to life.

Flood risk is a product of the likelihood of the event occurring and the consequences due to the event. Flood risk can apply to property (in the form of damage to buildings, cars and other possessions) or life (serious injury or death).

The Probable Maximum Flood (PMF) has a nominal likelihood of  $10^{-7}$  AEP or a 1 in 10 million chance of occurring in any given year.

On the basis the site is located at a local crest, and well in excess of the regional PMF, we also expect the consequences in a flood event to be low.

The resultant flood risk for the subject site is low.

## **Flood Controls**

The main controls for the subject site are floor level and emergency response.

Due to the topography, the floor levels are set well in excess of the regional PMF. This minimises the risk to property.

It is expected the school will have an emergency response procedure in the event of flood. This may include closing the school in advance of predicted extreme rainfall to minimise the number of people exposed to the flood risk, as well as making provision to seek refuge on-site in the event of a flood.

## **Street and Site Drainage**

The TUFLOW model does not include street drainage in the town centre. We understand the street drainage will be designed by Enspire Solutions and the site drainage will be designed by TTW.

## **Conclusion**

The flood risk on the subject site is low and we consider this satisfies the intent of Condition 16.

We trust this is what you require. Should you have any queries, please feel free to contact the undersigned on 0413 358 531.

Regards,



**Angus Brien**  
Civil Engineer  
BEng (Civil)(Hons)